

IN THE CLAIMS:

Claims 1, 4, 6, 8, and 9 have been amended herein. All of the pending claims 1 through 10 are presented below. This listing of claims will replace all prior versions and listings in the application. Please enter these claims as amended.

1. (Currently Amended) A semiconductor assembly comprising:  
a substrate having a plurality of circuits on a portion of a surface thereof;  
a semiconductor die having a plurality of bond pads located on an active surface thereof and having a back side surface;  
a plurality of solder balls connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate;  
one of a glob top material ~~and~~ and a low viscosity polymeric material ~~filling~~ filling any space between the substrate and the semiconductor die;  
a gel elastomer contacting at least a portion of the back side surface of the semiconductor die, wherein the gel elastomer is compliant, adhesive, and filled with a thermally conductive material; and  
a heat sink cap covering the gel elastomer, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion of the gel elastomer.

2. (Original) The semiconductor assembly of claim 1, wherein the heat sink cap includes a plurality of fins thereon.

3. (Original) The semiconductor assembly of claim 1, wherein the gel elastomer includes a cross-linked silicone.

4. (Currently Amended) A semiconductor assembly comprising:  
a substrate having a surface having a plurality of circuits on a portion thereof;

a semiconductor die having a plurality of bond pads located on a first portion of an active surface thereof and having a back side surface;

a plurality of solder balls connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate;

one of a glob top material ~~and~~ and a low viscosity polymeric material ~~filling~~ filling any space between the substrate and the semiconductor die;

a gel elastomer contacting a portion of the back side surface of the semiconductor die, wherein the gel elastomer is a cross-linked ~~silicon~~ silicone gel, compliant, adhesive, and filled with a thermally conductive material; and

a heat sink cap having a portion thereof in contact with a portion of the gel elastomer, the heat sink cap covering the gel elastomer, the semiconductor die, the plurality of solder balls, and at least a portion of the substrate.

5. (Original) The semiconductor assembly of claim 4, wherein the heat sink cap includes a plurality of fins thereon.

6. (Currently Amended) An assembly comprising:

a substrate having a plurality of circuits on a portion thereof;

a semiconductor die having a plurality of bond pads located thereon and having a back side surface;

a plurality of solder balls connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate;

one of a glob top material ~~and~~ and a low viscosity polymeric material ~~filling~~ filling any space between the substrate and the semiconductor die;

a compliant, adhesive, and filled with a thermally conductive ~~material~~ material, gel elastomer contacting at least a portion of the back side surface of the semiconductor die; and

a heat sink cap covering the compliant, adhesive, and filled with a thermally conductive ~~material~~ material, gel elastomer, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion of the gel elastomer.

7. (Original) The semiconductor assembly of claim 6, wherein the heat sink cap includes a plurality of fins thereon.

8. (Currently Amended) The semiconductor assembly of claim 6, wherein the compliant, adhesive, and filled with a thermally conductive-~~material~~ material, gel elastomer includes a cross-linked silicone.

9. (Currently Amended) An assembly comprising:  
a substrate having a plurality of circuits on a portion thereof;  
a semiconductor die having a plurality of bond pads and having a back side surface;  
a plurality of solder balls connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate;  
one of a glob top material-~~and~~ and a low viscosity polymeric material-~~filling~~ filling any space between the substrate and the semiconductor die;  
a compliant, adhesive, and filled with a thermally conductive-~~material~~ material, gel elastomer contacting a portion of the back side surface of the semiconductor-~~die;~~ die, and  
a heat sink cap having a portion thereof in contact with a portion of the compliant, adhesive, and filled with a thermally conductive-~~material~~ material, gel elastomer, the heat sink cap covering the compliant, adhesive, and filled with a thermally conductive-~~material~~ material, gel elastomer, the semiconductor die, the plurality of solder balls, and at least a portion of the substrate.

10. (Original) The semiconductor assembly of claim 9, wherein the heat sink cap includes a plurality of fins thereon.